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**COMMAND AND CONTROL OF ENGINEERS  
IN JOINT OPERATIONS**

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## **Foreword**

Joint doctrine, which places the engineer staff element under the J-4, is seriously flawed. Recent operations are replete with examples where this doctrinal concept was either altered or ignored altogether. In those cases where it was reluctantly followed, success occurred in spite of established doctrine, not because of it. In a downsizing military, war fighters must maximize all potential combat enhancers and multipliers. In both war and military operations other than war (MOOTW), engineers are constantly in demand, never in abundant supply, and habitually overworked. Our doctrine must evolve within the context of our rapidly changing global threat. To simulate that change, we must encourage the combatant commanders and our sister services to enter the debate.

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## **Command and Control of Engineers in Joint Operations**

Current joint war-fighting doctrine subordinates the engineering function under the auspices of the J-4. Navy and Air Force engineers accept this arrangement as natural. They are technical or specialty officers, not line officers, and they routinely concentrate on base construction and maintenance. Lacking the Army's diverse ability to support ground combat as well as provide infrastructure, they appear to be comfortable being compartmentalized under the logistics staff officer. Army engineers, however, chafe at this structure and aggressively strive to alter it. Recent joint war-fighting exercises, military operations other than war (MOOTW), and Operation *Desert Storm*, often violated the joint doctrinal approach to engineering command and control relationships. They also vigorously challenged existing doctrine for analyzing lessons learned and writing after-action reports.

### **Why the Dilemma?**

In those cases where doctrine *was* followed, success was a matter of extraordinary cooperation among the services. It worked because of the personalities involved, not because it was sound doctrine.<sup>1</sup> As we adjust to the realities of additional budget cuts and continued downsizing, we must constantly seek more effective and efficient ways of doing business. Demands for engineer assets will always exceed

engineer force capabilities, especially in the early stages of an operation.<sup>2</sup> In joint and multinational operations, the flexibility to transition from "early entry" combat operations to force support must be inherent in the task organization and engineer force structure. Command and control must be seamless.

Recent history and the challenges of post-cold-war foreign policy indicate the United States will continue to involve itself in MOOTW whenever it feels a situation involves our national interests. Additionally, there will be occasions where we are backed into a corner and forced to participate in such operations either as a result of the coercion of our allies or pressures from the American public and the media. "Rapid force projection from platforms in the Continental United States or forward-presence bases, extended lines of communication and potential forcible entry into logistically bare-base areas of operation require continual evolution from present doctrine."<sup>3</sup> Continued participation in MOOTW is inevitable. Preparing ourselves to fight and win America's future wars demands that we ensure today's joint doctrine optimizes all available combat enhancers and multipliers, including engineers.

## **Background**

Throughout the history of the US Army Corps of Engineers, a heated controversy has persisted over the issue of whether Army

engineers are a combat arm or a combat support arm. As recently as this past year, the debate flared as the Army wrestled with the issue of women in combat and whether to allow female soldiers to serve in combat engineer units. Amid this dialog, however, no one has ever categorized engineers as a combat service support arm. Why then do we find ourselves directed by joint doctrine to function as an element of the J-4 and assigned to logistical support commands? This is contrary to Army doctrine concerning the command and control of engineer units and should never have worked its way into current joint doctrine. Now, every time engineers deploy on joint operations or participate in joint training exercises, an inordinate amount of time is wasted during the initial stages in sorting out where the engineers belong and who will command the engineer assets.

Joint and multinational operations are the wave of the future. In fact, "political and military considerations require that most operations, both in War and MOOTW, will be multinational and multiagency and involve nongovernmental organizations (NGOs) and private voluntary organizations."<sup>4</sup> The sizable "peace dividend" predicted by politicians, writers, academicians, and the media following the fall of communism has failed to materialize. Peace, it seems, is more fleeting now than during the cold war period. Political unrest throughout third world countries coupled with famine and dwindling natural resources has

forced the US to become deeply involved in numerous MOOTW.

Engineers played critical roles in all these operations and established a reputation for providing superb, timely support across the full spectrum of missions within the theater of operations. They were constantly in demand, never in abundant supply, and habitually overworked.

### **The Challenge**

As war fighters and planners look toward the twenty-first century, they will be challenged to find innovative ways to do more with less. Army planners and combat developers are wrestling with these issues today as they attempt to define *Force XXI*. This is an opportune time to reexamine the issue of command and control of engineer forces in joint operations. "We must begin now to change the way we think and organize staffs, information flow, procedures, and possibly organizations."<sup>5</sup> Recent experiences indicate there are better alternatives to placing engineering forces and functions under the J-4. This paper considers such alternatives as placing engineers under the J-3 or establishing engineers as a separate staff agency entirely.

The next section compares and contrasts Army and joint doctrine regarding the command and control of engineers at the operational level. The third section is devoted to analyzing historical examples of major US operations where engineers played an essential role. It draws from combat examples, MOOTW, and joint war-fighting exercises. The fourth



section analyzes the pros and cons of leaving engineers under the J-4 and considers whether engineers should be placed under the J-3 or be established as a separate special staff organization. The final section discusses the need for change. It defends the notion of establishing engineers as a separate staff agency responsible for all aspects of operational engineering: combat, construction, and topographic. It concludes by considering this position within the context of emerging Army concepts for *Force XXI*.

### **How It's Supposed to Work**

Army engineers aggressively defend their doctrine, which establishes engineers as a separate special staff element. This doctrine recognizes the fact that although Army engineers must be capable of performing all types of engineering functions, support to the maneuver commander is usually the top priority.

### **Army Doctrine**

The latest field manual on Army Operational Support, FM 100-16, states, "All Engineer units (combat, construction, or topographic) are focused on operations in the combat zone."<sup>6</sup> Thus, they must be involved in planning, providing necessary personnel, equipment and materiel, and integrating engineer capabilities into the concept of operations according to the maneuver commander's intent. Again, FM 100-16 captures this

principle: "Engineers must be closely tied into current and future operational planning and have their own command and control structure to assure the timely and proper execution of the intent and scheme of maneuver."<sup>7</sup>

The April 1994 final draft of FM 100-7, *Decisive Force: The Army in Theater Operations*, further delineates the Army's position on command and control of operational engineering functions. It states, "The primary focus of the operational logistician is on: reception, positioning of facilities, materiel management, movement control, distribution management, reconstitution and regeneration, and redeployment."<sup>8</sup> It makes no mention of engineering or command and control of engineer forces as a function of the logistician. In a later chapter, it establishes the Army service component commander (ASCC) as the agent who supplies engineer support in the communications zone (COMMZ) to provide the facilities needed to receive, stage, move, and support combat forces; ensures that lines of communications remain open; and provides engineer support to other services.<sup>9</sup>

The United States Army Engineer School strongly objected to the concept of subordinating engineering functions within logistical channels. In their official response to the draft of FM 100-7, the Engineer School staff argued that engineers "support operational and logistical requirements, but must *not* be rolled into the logistics support

structure of the theater." Furthermore, the school's official position is that "the senior engineer commander is responsible for ensuring *all* engineer battlefield functions are fully planned, integrated, synchronized, and executed to support the maneuver commander's intent and scheme of maneuver."<sup>10</sup>

### **Joint Doctrine**

When we move into the joint doctrinal arena, the engineer picture becomes even more diluted and extremely confusing. There is no single staff element which plans and coordinates the overall engineer effort. In the operations division, the J-3 supports the scheme of maneuver for combat by assisting the commander in directing and controlling operations. Included in his responsibilities are requirements to plan, coordinate, and integrate the engineering functions of mine warfare and disaster relief as well as mobility, countermobility, and survivability operations. The engineer staff element, however, is buried in the J-4 section.

In the logistics division, the J-4 coordinates and supervises the traditional functions of supply, maintenance, repair, evacuation, and transportation. Where the picture becomes confusing is when joint doctrine superimposes construction and other engineering functions on the J-4 section. Specifically, J-4 responsibilities include exercising staff responsibility over military engineering missions such as engineer

reconnaissance and intelligence, bridge and river crossing operations, barrier operations, construction, maintenance, and base development. Several of these functional areas are more operationally than logistically oriented.

In the plans and policy division, the J-5 assists the commander in long-range planning and in preparing campaign plans.<sup>11</sup> In this staff section, there is no mention of engineer planning. Thus, no provisions have been made to include an engineer liaison to assist in the development of future plans and operations.

Joint doctrine does, however, offer a loophole which is being exploited today as a defense against subordinating the engineer function under the J-4. "A joint force commander is authorized to organize his staff and assign responsibilities to individual service members assigned to his staff as he deems necessary to ensure unity of effort and accomplishment of assigned missions."<sup>12</sup> While this provision is available to a joint commander to allow him to place his engineer staff element wherever he deems appropriate, relying on this as a solution violates the principle of "Train as you intend to fight."

The solution to this engineer force alignment dilemma does not lie in finding ways to work around existing joint doctrine. The solution is to analyze existing requirements and challenge doctrine as necessary to ensure our war-fighting commanders are provided with the most lethal,

versatile, and effective engineer force: An engineer force structure and organization capable of achieving decisive results in war and operations other than war as a joint or multinational team.<sup>13</sup>

### **How It Really Works**

Engineers must be prepared to provide the war-fighting commander with the ultimate in engineer support regardless of the nature of the mission. The JTF commander or war-fighting CINC operates in an extremely complex, stressful, information-intensive environment.

The commander must simultaneously execute, mount and recover from operations ranging from war to humanitarian assistance in environments that are increasingly hostile, uncertain, confusing, and ambiguous. He must synchronize all of his operating systems. He must do this all very quickly and while under instant public scrutiny.<sup>14</sup>

The ability of the JTF engineer to conceptualize the commander's intent and provide concise, timely advice on engineer matters has been key to the success of a variety of combat and humanitarian assistance operations over the past five years.

### **Persian Gulf War**

When units began to deploy to the Persian Gulf in August 1990,

the success of engineering operations typically depended more on the ability of each service to find solutions to challenges than to use accepted joint doctrine for the command and control of engineer assets.

Fortunately, there was an adequate existing infrastructure within Saudi Arabia to contract out many engineering requirements. This helped compensate for the initial scarcity and dispersion of engineer units, and for the late arrival of a true theater engineer element.

Operation *Desert Shield/Desert Storm* eventually developed into a full-scale theater of operations, complete with the introduction of an engineer command (ENCOM). Analysis of command and control of *theater* engineers in a mid- to high-intensity conflict is beyond the scope of this paper. Many of the challenges engineers face today in conducting joint operations, however, are identical to those encountered by the commander of the 20th Engineer Brigade in the early stages of the Gulf War.

Since the 20th Engineer Brigade had the overwhelming majority of engineer troop assets, multiple headquarters wanted the brigade to respond to their direction: CENTCOM, XVIII Airborne Corps, and the senior logistician in the theater. The engineer commander was forced to manage by committee, using personal persuasion and frequent open communications to smooth things out and make things happen.<sup>15</sup> It was only by force of personality and by innovations such as monthly engineer

meetings that missions were so effectively accomplished. Finally, three months into the operation, the 416th Engineer Command (USAR) arrived in-theater and assumed overall responsibility for theater engineer forces.

### **Operation *Provide Comfort***

With US participation in Operation *Provide Comfort*, the military moved into the first of many contemporary military operations other than war. Similar operations in Somalia, Macedonia, Rwanda, and Haiti would soon follow and build upon the experiences gained from conducting joint and multinational operations with the United Nations. Engineer units from all services as well as the United Kingdom and the Netherlands were involved in the relief effort and were vital to the success of the operation.

At the combined task force (CTF) level, the staff engineer worked for the C<sup>4</sup> but he had only a staff role and no command function or directive role over engineer troops. The senior engineer on the ground, the commander of the 18th Engineer Brigade, was dual-hatted as both the JTF engineer and a major subordinate commander under Commander, Joint Task Force-Bravo (JTF-B). All engineers, regardless of service or country, were placed under the operational control (OPCON) of the 18th Engineer Brigade.

Within JTF-B, the JTF engineer broke with joint doctrine from the outset and established a separate engineer component with liaisons in

the J-3, J-4 and J-5 staff elements. Essential to the success of the operation was the fact that the senior engineer had access to the commanders of both the CTF and JTF-B. He clearly understood the intent of both commanders and was able to translate their vision into the total engineer effort.<sup>16</sup>

### **Hurricane Andrew**

Our next experience in MOOTW took place in the United States. When military forces were ordered to participate in relief efforts in the wake of Hurricane Andrew, it was the largest peacetime deployment of DOD forces ever in the continental United States.<sup>17</sup> The task was clearly engineer-intensive, and a special engineer staff element was created within the joint task force to plan, prioritize, and direct the engineer effort. The commander of the North Central Engineer Division was appointed as the JTF Engineer. An active duty engineer group headquarters, augmented by Air Force, Navy, and Marine Corps personnel, constituted his staff. "Appointing a U.S. Army Corps of Engineers (USACE) Division Engineer and using an active duty Engineer Group as the JTF Engineer staff ensured the synchronization of USACE and JTF Engineer effort."<sup>18</sup>

In a clear break with existing joint doctrine, the JTF engineer was not subordinated to the J-4. His organization was established as a separate element of the JTF commander's special staff, with direct access



to the commander. This allowed the JTF engineer to capture the commander's intent and direct diverse engineer efforts across the entire spectrum of both military and civilian capabilities. The overwhelming success of military engineering efforts is well-documented in after-action reports, military periodicals, and throughout the civilian news media. While it is impossible to prove whether or not the same degree of success would have been achieved with the JTF engineer buried in the J-4 organization, unquestionably the command and control of joint engineers was extraordinarily effective in this case when organized as a separate staff element.

### ***Operation Restore Hope***

In Somalia, US engineers were called upon to perform a wide variety of engineering missions in support of the joint task force. They enhanced mobility throughout the country by conducting countermine operations, airfield repair, bridge erection, road maintenance, and road construction. Their equipment, materiel, and skills were constantly employed for force protection: erecting protective berms, bunkers, and guard posts. Vertical construction capabilities were instrumental in erecting base camps. Work requirements quickly exceeded force capabilities, and every available engineer unit was called upon to contribute to the effort across the full spectrum of engineer missions. In that austere environment, their efforts were unquestionably crucial to

mission accomplishment and success. Centralized control of all engineer assets was essential.

"The deployed engineer force was a 'joint and combined' effort, building on the engineer capabilities found with each service component and coalition partner."<sup>19</sup> The JTF engineer for Operation *Restore Hope* had been the 20th Engineer Brigade commander in the Gulf War. He put his experiences to good use in organizing and orchestrating the engineer efforts of the joint task force. He ensured full cooperation among all services and made optimal use of the complementary capabilities brought to the task force by US and coalition engineers.

In this instance, joint doctrine was followed and the JTF engineer and his staff were placed under the control of the J-4. Although the arrangement was satisfactory, it was far from optimal. The JTF after-action report, while praising the quality and accomplishments of engineer units, questioned the wisdom of the command and control arrangements. The overwhelming concern of the JTF engineer's access to the command group was to grasp the commander's intent and resolve conflicts. In this instance, the personalities were more responsible than the organizational structure for the success of the operation.<sup>20</sup> The report recommended establishing the JTF engineer as a special staff element for any future joint operations requiring a large engineer effort. Alternatively, for smaller operations not requiring special engineer staff

status, it recommended placing the engineer staff within the J-3, not the J-4.

### **Operation *Continue Hope***

In the second stage of the Somalia operation, the remaining small US engineer element was placed under the United Nations Logistics Support Command (UNLSC). The engineer mission envisioned for UNISOM II was strictly repair and maintenance of existing facilities with no anticipated combat engineering support. Therefore, the modest US engineer contingent was strictly construction-oriented with only enough combat capability for self defense. As to its construction capabilities, it had no design or quality control expertise in new construction. Furthermore, the UNLSC was not equipped to provide proper maintenance support and did not fully understand the capabilities and limitations of the engineers under their control.

When the President directed the establishment of Joint Task Force Somalia (JTF-Somalia) after a battle between US Army rangers and Somali gunmen, the engineer picture became even more convoluted. An engineer staff section was created on the joint staff and manned with an ad hoc team of Army and Marine engineers. An engineer battalion was deployed as part of the quick reaction force (QRF) of the joint task force and its commander became the senior engineer officer in the theater. On the UN side, the engineer staff element of the UNLSC was reinforced with

additional engineer officers and noncommissioned officers.

Once again, engineers managed to "work around" the limitations of existing joint doctrine to accomplish the mission. The commander of the engineer battalion assigned to JTF-Somalia had also commanded his battalion in Somalia during Operation *Restore Hope*. He had been present at weekly coordination meetings held among all engineer elements within the theater. Recognizing this as an effective method to coordinate the activities of several diverse engineer elements, he employed the same technique to orchestrate the overall effort. These meetings established engineering priorities, allocated scarce construction materials, and determined which tasks would be accomplished by troop units and which would be performed by the Logistics Civil Augmentation Program (LOGCAP) contractor in Somalia.

While all tasks were accomplished in the end, the success of the operation was *in spite of* current joint doctrine, *not because of it*. Nobody orchestrated the *total* engineer effort to include coalition engineering capabilities. Both JTF-Somalia and the UNLSC turned down the offer of an engineer group headquarters to coordinate the overall engineer effort and free the units on the ground to focus solely on mission accomplishment. Again, it was primarily by strength of the personalities involved that competing priorities were resolved and the commander's intent was executed.

## **Operation *Restore Democracy***

When US forces intervened in Haiti, the engineering portion of the operation took on monumental dimensions. Although engineering elements of all services were involved, the vast majority of the task force engineers were supplied by the Army under the control of the 20th Engineer Brigade. The brigade commander determined from the start that joint doctrine, which placed engineers under the J-4, was flawed. "We keep rediscovering that the engineer does not work best under the J-4 when we form a JTF on the ground. It did not work in Somalia and it did not work for us here."<sup>21</sup>

Subsequently, he forced the issue with the joint staff and proposed the creation of a separate engineer staff section distinct from the J-4. The intent was not to aggrandize engineers and have them work in isolation. The commander fully understood the need to establish liaison officers in the J-3, J-4, and J-5 to facilitate planning and coordination. "Establishing the JTF Engineer as a special staff in JTF-190 was key to success in accomplishing the continuum of engineer missions during Operation *Uphold Democracy*."<sup>22</sup>

The visibility this move afforded the JTF engineer proved its merit immediately. Even though the intervention was essentially peaceful, initial engineer operations were all force-protective in nature. They included constructing foxholes and fighting positions, building earthen

berms, and erecting wire obstacles.<sup>23</sup> As the engineer focus shifted from tasks that were predominately combat-oriented to tasks that were focused on improving the infrastructure within the area of operations, the transition was seamless. Since the same engineer units were expected to accomplish all missions, it naturally followed that they should be commanded and controlled by a single headquarters.

### **Exercise *Prairie Warrior***

Although this paper focuses on the operational level of war, theater engineering organizations are struggling with the relationship of the theater engineer to the J-4 as well. Similarly, they do not believe this is the most efficient and effective command and control structure. In a recent after-action review of an exercise in which the 416th Engineer Command (USAR) participated, the key issue again revolved around command and control of engineers.

Exercise *Prairie Warrior* employed a two-corps Southwest Asia (SWA) scenario with a developing Korean conflict. The initial CENTCOM organization placed the engineer staff under the J-4 with the engineer command (ENCOM) under operational control of the Theater Army Area Commander (TAACOM). Prior to execution, the ENCOM convinced the commander in chief (CINC) of CENTCOM that the engineer staff element would be more effective in operational channels. When they were subsequently placed within the J-3 organization, engineer

responsiveness and effectiveness was significantly increased.

The ENCOM's overwhelming conclusion was that the senior engineer commander must maintain oversight over the entire set of theater engineer requirements. He must have operational visibility to balance engineers of all services throughout the combat zone as well as the COMMZ.<sup>24</sup> Although the after-action report did not address the concept of establishing the engineer element as a separate special staff, the overarching theme throughout was that placing the engineer staff under the J-4 was definitely *not* the solution.

## **Comparative Analysis**

In considering the optimal command and control relationship for engineers, three alternatives emerge worthy of analysis: to maintain the status quo as outlined in joint doctrine with the engineer staff element controlled by the J-4; to subordinate the engineering function under the J-3 because of operational implications; or to create a separate engineer staff element.

### **The Case for Control by Logisticians (J-4)**

Several engineer functions, such as real estate acquisition, facilities management, and environmental compliance, naturally fall within the arena of the J-4 as the provider and controller for these services. "The heart of the problem appears to be the difference in perspective between the services on how to employ engineer assets (e.g., Air Force engineers are not combatants)." <sup>25</sup> Since the preponderance of Navy and Air Force engineer units have a civil engineering focus, placing their functions under the J-4 is a comfortable and logical arrangement. Recent experience, though, shows that the majority of joint operations have been predominantly ground-oriented. Typically, the bulk of the initial entry engineer units have been Army assets in support of the ground combatants. For the engineer staff element, subordination to the J-4 has been a convoluted arrangement that has caused gaps between providing support to combat maneuver forces and rapidly creating or



improving existing infrastructure as the missions expand. Thus, the diverse capabilities of multipurpose Army engineer units must be taken into account when developing joint doctrine.

In those instances where joint doctrine was followed, the participants strenuously argued the inefficiencies of the arrangement after the mission was complete. In the remainder of the operations, engineers opted for either subordination under the J-3 or established themselves as a separate special staff. Because of the broad scope and intensity of engineer missions in conjunction with large-scale operations, the task has become too cumbersome to be managed through the J-4. Placing the engineer function under the J-4 precludes visibility of engineer assets within J-3 (operations) or J-5 (plans). "All Engineer units (combat, construction, and topographic) are focused on actions at the operational tip of the spear. They support operational and logistical requirements, but must not be rolled into the logistics support structure of the theater."<sup>26</sup> The bottom line remains that burying the engineer staff within the J-4 organization seriously detracts from their ability to internalize the commander's intent and support the full range of engineering requirements.

### **The Case for Control by Operations (J-3)**

Engineers are an essential combat multiplier and must be properly integrated and task organized from the outset of an operation. "At the

operational level within the theater, the engineer and the logistician share numerous interests. However, they have a fundamentally different focus and their command and control structures are not combined."<sup>27</sup> In the initial stages of the operation, the engineer focus will be directed more toward combat engineering with somewhat less emphasis on construction. Mobility, countermobility, and survivability of combat forces are clearly operational considerations. However, so are repair and maintenance of main supply routes (MSRs) and airfields (because of their impact on combat operations).<sup>28</sup>

Accordingly, engineer staff elements must be within the planning loop from an operation's inception. The J-3 must have full visibility over *all* operations, to include engineering operations, to take maximum advantage of their potential as a force multiplier and enhancer. To coordinate forces across the entire spectrum of battlefield missions, J-3 requires an element within his organization that has the requisite experience and expertise to effectively incorporate limited engineer resources. This provides him with the flexibility to capitalize on the unique capabilities of the full range of engineer forces. Anticipation of the combatant commander's needs based on a firm understanding of his intent is a sound argument for adjusting doctrine to place all engineering staff functions under the J-3.

## **The Case for Engineers as a Special Staff Element**

There is considerable intuitive appeal for the proposal to move the engineer section from J-4 to J-3 as argued above. Although it avoids the temptation to create a new special staff element, it is not necessarily the *best* solution. "We must not reduce staffs solely for the sake of reducing them. The assimilation of data and information and application of judgment for key decisions will continue to require competent teams assisting commanders."<sup>29</sup> Thus, there is another alternative which warrants consideration: to establish a special engineer staff element within the joint staff. Then, from his own resources, the JTF engineer would place liaison elements in J-3, J-4, and J-5 to maintain full, uninterrupted interface with those staff agencies to ensure seamless engineer support.

The engineer liaison to J-3 would focus on *current* combat operations. His primary responsibilities would include (1) advising the JTF commander on employing engineer assets to help shape the battlefield and (2) monitoring mobility, countermobility, survivability, and sustainment operations in support of combat maneuver forces. Equally important, establishing an engineer liaison with the J-5 provides that staff section with the ability to focus on *planning* for the employment of engineers in *future* operations.

The engineer liaison to the J-4 would maintain the connection

between the JTF Engineer and the logistics element that initially led to placing the engineer element under the J-4. It would retain the crucial link between the two sections in order to best orchestrate construction management and the maintenance of facilities, and the leasing, management, and disposal of real estate throughout the area of operations.

Equally critical, engineer participation in the purchase of construction materiel is essential when substitutions are necessary.

"Substitution is a common engineering practice and will likely have a ripple effect with other items on a particular bill of materials.

Logisticians cannot chart the effects of substituting materials and it is unfair to expect them to do so."<sup>30</sup> Therefore, the engineer liaison is essential to coordinating the acquisition and prioritization for the distribution of construction materiel and other critical Class IV materiel with the J-4.

The operational commander's ability to execute his campaign plan requires a highly flexible, versatile engineer task organization to achieve operational objectives.<sup>31</sup> "The senior engineer commander ensures that all engineer battlefield functions are fully planned, integrated, synchronized, and executed to support the commander's intent and scheme of maneuver."<sup>32</sup> By placing liaison officers with the engineer staff element, the senior engineer commander would have the ability to

maintain visibility over the entire spectrum of engineer requirements. He would be a full participant in all operational planning and in the best position to establish priorities and make recommendations to the commander on the optimum allocation of limited engineer assets.

### **Conclusions**

Our participation in the Gulf War, MOOTW (including disaster relief operations at home), and major training exercises has provided us with a wealth of experience in joint and multinational operations. At the end of each campaign, operation, or exercise, we have painstakingly analyzed our performance, produced the requisite after-action reports, and disseminated lessons learned. In the final analysis, after conducting a myriad of diverse operations over the past five years, we seem to repeatedly come to the same conclusion: Placing the engineer staff element under the J-4 does not allow us to take maximum advantage of a limited resource that is vital to every type of joint operation imaginable engineers!

### **The Need for Change**

A detailed review of recent military operations demonstrates that engineers drew upon their full range of capabilities and were crucial to success. This is unlikely to change as we look to the future. "For almost any conceivable contingency operation the engineer units on the troop

list will be expected to provide both engineering services and construction while concurrently supporting combined arms operations."<sup>33</sup> Furthermore, in each instance, the JTF or CTF commander selected an Army officer as his engineer. Because Army engineers do not specialize in strictly combat engineering or civil engineering career fields, they are uniquely qualified to organize and control all aspects of operational engineering. Yet, joint doctrine ignores the Army position on command and control of engineers and chooses to place them under the J-4 in acquiescence to the other services' doctrines.

In this regard, engineers are perhaps their own worst enemy. They are incredibly versatile and adept at finding innovative solutions to almost any challenge. Thus, each time they are inserted into a joint organization, they exhibit an uncanny ability to produce consistently superb results regardless of the command and control relationships. The sad part is that they could be much *more* effective if they didn't have to waste so much time initially sorting out better organizational structures if they could just get right to the business of providing quality engineering support to both war fighters and support elements!

A force cannot conduct combat operations without planning and executing mobility, countermobility, survivability, and sustainment operations in support of maneuver elements. In MOOTW, engineers are

indispensable to force protection and mobility enhancement. They also provide the joint task force with crucial construction capabilities to establish essential bare-base facilities for US forces, particularly in austere conditions. In responding to natural disasters, the commander must again tailor a force package heavy in engineer assets to clear debris, repair damaged roads and utilities, and provide for the basic needs of victims as well as the military organizations involved in the relief effort.

"The Army will have to make wise use of *all* of its resources to meet the challenges of the future. It must recognize where bold change is necessary and where little or no change is needed."<sup>34</sup> Perhaps the time is right to change joint doctrine. In the recent reorganization of the Department of the Air Force, Civil Engineering was removed from Logistics and created as a separate staff element on the Air Staff. Conceivably, they are now in a position to reassess joint doctrine and provide support to the Army's position.

### **Applicability to Force XXI**

When one is considering a modification of joint doctrine, one must not only examine historical experiences one must also look forward. How does the concept fit within the framework of emerging war-fighting doctrine for a smaller, more technologically dependent force in the next century?

Increases in lethality likely to emerge in the early part of the 21st century will so significantly change the complexion of the battlefield that to remain capable of providing decisive victory, America's Army will be required to make major changes in tactics, organizations, doctrine, equipment, force mixes, and methods of command and control.<sup>35</sup>

Through experimentation and validation by the Battle Labs, Louisiana Maneuvers Task Force, and the Experimental Force (EXFOR), Force XXI is emerging as the Army's answer to the challenges that lie ahead.

The concept of creating an independent, flexible, versatile engineer special staff element tailored to any contingency fits the construct of Force XXI precisely. "Combat Support and Combat Service Support must be modular, then capable of task-organizing for the mission. Future organizational design will capitalize on the full range of mission capabilities available in the total force structure, leading to the success that is essential for knowledge-based operation."<sup>36</sup> The proposal to change joint doctrine, as set forth in this paper, is affordable, makes sense, and has been tried and proven under the most challenging conditions.

Finally, concern for the welfare of our soldiers must be at the heart of everything we do doctrinally.

We must always remember that even in the information age, war will remain a human endeavor, subject to emotion and characterized by the shedding of blood and by the effects of chance. Information age warfare will not be remote, bloodless, sterile, or risk free it will still be war. And, ultimately, wars are won by soldiers on the ground.<sup>37</sup>



Those soldiers deserve no less than the most technologically advanced equipment, effective organizations, and flawless command and control systems we can develop. Change is needed and the time is right to correct the doctrinal disconnect concerning command and control of our engineers. With support from the war-fighting CINCs and cooperation from our sister services, we have the potential to greatly enhance our present capabilities and move forward into the 21st century.

### **Summary**

The future will likely be every bit as uncertain, chaotic, and challenging as the events that have shaped the world over the past five years. In those instances where we elect to use the military to resolve emerging crises and respond to emergencies, engineers will be an essential but scarce commodity. Recent experience demonstrates that it is imperative for the JTF engineer to understand the entire picture, particularly the commander's intent, if he is to properly plan, prioritize, and make recommendations regarding the employment of engineer forces.

The J-3, concerned with the maneuver aspects of the operation, will focus on the tactical components of engineering operations. The J-4, concerned with logistical aspects, will focus on the infrastructure capabilities of engineer forces. Neither will be in a position to step back

and consider the whole picture. The only way to ensure balanced engineer support across the entire operation is to establish the JTF engineer as a separate special staff section.

Our war fighters will be continually called upon to do more with less. We cannot afford to waste time deciding organizational issues in the midst of crisis planning. The solution is available to us today. It's time to enter the debate and resolve this issue before we place the lives of our soldiers, sailors, airmen, and marines at risk because our doctrine is faulty.

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